

Name:

Date:

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PART A In the space on the left, write the letter of the term or phrase which **best** completes the statement or answers the question (1 mark each).

- ____ 1. The atomic number equals ...
a. The number of neutrons.
b. The number of protons.
c. The number of neutrons plus the number of protons.
d. The number of neutrons minus the number of protons.
- ____ 2. The chemical name for SnCl_2 is ...
a. Tin chloride
b. Tin (II) chloride
c. Tin (IV) chloride
d. Tin dichloride
- ____ 3. If H_2SO_4 reacts with $\text{Mg}(\text{OH})_2$, what type of reaction is occurring?
a. Decomposition
b. Single replacement
c. Neutralization
d. Synthesis
- ____ 4. Which of the following is most likely because blue litmus paper to turn red?
a. Grapes
b. Water
c. Eggs
d. Bleach
- ____ 5. The release of a helium atom is involved in ...
a. Alpha decay
b. Beta decay
c. Gamma radiation
d. UV radiation
- ____ 6. Which of the following lowers bond-breaking energy?
a. Increasing the temperature
b. Increasing the surface area
c. Increasing the concentration
d. Adding a catalyst

- ___ 7. Lemon juice has a pH of ...
a. 12
b. 7
c. 2
d. 1
- ___ 8. The unstable reactant of radioactive decay is ...
a. A parent isotope
b. A daughter isotope
c. An alpha particle
d. A GammaRay
- ___ 9. A neutral atom has equal numbers of ...
a. Protons and neutrons
b. Protons and electrons
c. Neutrons and electrons
d. Subatomic particles
- ___ 10. The following type of radiation has the greatest penetration:
a. Alpha decay
b. Beta decay
c. Gamma radiation
d. Alpha decay and beta decay are tied for the greatest penetration
- ___ 11. Classify the following reaction: $2\text{MgO} + 2\text{Br}_2 \rightarrow \text{O}_2 + 2\text{MgBr}_2$
a. Single replacement
b. Synthesis
c. Double replacement
d. Decomposition
- ___ 12. The pH scale measures the concentration of ...
a. Water
b. Hydrocarbons
c. OH⁻ ions
d. H⁺ ions
- ___ 13. Which of the following has a mass of 0 and an electric charge of 1-?
a. An alpha particle
b. A neutron
c. A beta particle
d. A proton
- ___ 14. Which reaction type has water and carbon dioxide as its products
a. Neutralization
b. Combustion
c. Decomposition
d. Single replacement

- ___ 15. A neutrino is a particle with ...
- Energy, but no mass or charge
 - Energy and mass, but no charge
 - Mass, but no energy or charge
 - No mass, energy, or charge

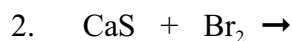
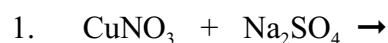
PART B In the space provided mark each of the following as true or false. (1 mark each)

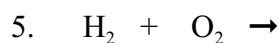
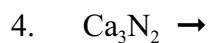
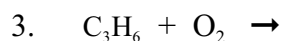
- ___ 1. A product of beta decay is an electron.
- ___ 2. Ionic bonding involves the sharing of electrons between two non-metals.
- ___ 3. Nuclear fission involves combining two smaller nuclei into a more massive nucleus.
- ___ 4. Radiocarbon dating is used to date living organisms.
- ___ 5. Valence electrons are the electrons located in the outermost shell.
- ___ 6. Increasing surface area is always an option to increase reaction rate.
- ___ 7. Neutrons are involved in initiating and continuing chain reactions.
- ___ 8. Alcohols are hydrocarbons that contain hydrogen, carbon, and oxygen
- ___ 9. The majority of nuclear power in the world comes from nuclear fusion reactors.
- ___ 10. Methyl red is yellow when placed in the basic solution.
- ___ 11. Red litmus paper turns blue in the presence of an acid.
- ___ 12. Protons and neutrons are located inside the nucleus.
- ___ 13. The mass of the reactants always equals the mass of the products.
- ___ 14. Lewis diagrams show how many electrons are in each shell surrounding the nucleus.
- ___ 15. Isotopes have the same number of neutrons but differing numbers of protons.

PART C In the space provided, match each term or phrase with the best definition. (1 mark each)

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|------------------------|---|
| ___ 1. Alpha particle | A. Formed by positive and negative ions. |
| ___ 2. Neutron | B. A type of reaction that involves an acid and a base. |
| ___ 3. Covalent bond | C. Formed when non-metallic atoms share electrons. |
| ___ 4. Combustion | D. Has a mass number of 4 and an atomic number of 2. |
| ___ 5. Fusion | E. Compound containing carbon and hydrogen. |
| ___ 6. Ionic bond | F. Has no mass and no charge. |
| ___ 7. Beta particle | G. Involves combining two smaller nuclei into one more massive nucleus. |
| ___ 8. Chain reaction | H. Can be induced by bombarding the uranium-235 atom with neutrons. |
| ___ 9. Fission | I. Equal to the atomic number of an atom or ion. |
| ___ 10. Neutralization | J. The number of these differs between isotopes of the same element. |
| ___ 11. Proton | K. A reaction where one reactant turns into multiple products. |
| ___ 12. Gamma ray | L. Has the same charge and mass as an electron. |
| ___ 13. Hydrocarbon | M. Type of reaction involving two reactants forming one product. |
| ___ 14. Decomposition | N. A reaction between a hydrocarbon and oxygen. |
| ___ 15. Synthesis | O. The splitting of a massive nucleus into two less massive nuclei. |

PART D Complete **AND** balance the following reactions, then classify the reactions as synthesis, decomposition, single replacement, double replacement, neutralization, or combustion. (3 marks each: 2 for the completed and balanced reaction, and 1 for the correct classification)





PART E Write the names of the following compounds. (1 mark each)

1. The name for Sr_3N_2 is ...
2. The name for YBr_3 is ...
3. The name for NH_4OH is ...
4. The name for N_2O_4 is ...
5. The name for $\text{Co}_2(\text{SO}_4)_3$ is ...
6. The name for H_2SO_3 is ...

PART F Write the chemical formulas of the following ionic compounds. (1 mark each)

1. Cesium sulphide is called ...
2. Carbon tetrabromide is called ...
3. Gold (III) oxide is called ...
4. Lithium phosphate is called ...
5. Platinum (IV) hydroxide is called ...
6. Hydroiodic acid is called ...

PART G Each question requires a short answer or a sketch as necessary.

1. Draw a Lewis diagram for KBr . (1 mark)

2. Draw a Bohr diagram for NH_3 . (1 mark)
3. You believe that a solution has a pH of 6.0. Which two pH indicators could you use to confirm that the solution does in fact have a pH of 6.0? If it is 6.0, what colours will be indicators be? (2 marks)
4. Name and describe any two ways that you could increase the rate of reaction. (2 marks)
5. What type of reaction occurs at the core of the sun and why is it so difficult for humans to induce this reaction on Earth? (2 marks)